

File No.: JP-12806PCT
Dispatched No.: 356258
Date of Dispatched: October 5, 2004

OFFICE ACTION
(translation-in-part)

Patent Application No.: 591719/2000
Examiner: Susumu Takagi
Patent Attorney: Sohta Asahina (and three others)
Provision to be applied: Article 29, Paragraph 2

The instant application is recognized to be rejected for the following Reason. If Applicant has any objection against the reason, Argument should be filed within three months from the date of dispatched the office action.

REASON

It is recognized that the invention described in Claims of the instant application could easily have been made by a person skilled in the art to which the invention pertains, on the basis of an invention referred to in the following publications distributed in Japan or foreign countries prior to filing of this application. Therefore, the instant application cannot be allowed under the proviso of Article 29, Paragraph 2 of Japanese Patent Law.

NOTE

(1) Claim 1, 2, 12 to 22

(Reference 1, 2)

Reference 1 (see Figs.3, 4) discloses that multi carrier signal

amplified by power amplifier is fed back to corresponding modulator and linearity is compensated. Reference 2 (see Figs. 1, 2) discloses that output of power amplifier is partially fed back and DC offset adjustment, phase shift and amplitude adjustment are performed. Therefore, altering distortion given in advance by predistortion means subsequently in dependence on the difference between input and output of the amplifier could easily have been made by a person skilled in the art.

(2) Claim 3 to 6

(Reference 1 to 4)

Using combiner for synthesizing composite signal, or performing predistortion before or after synthesizing the composite signal could be done by a person skilled in the art as desired, and no special effect is considered. Reference 3 (see Fig. 1 and relating description), for example, discloses to combine the output of three variable gain preamplifier by a combiner. Further, reference 4 (see Fig. 1 and related description) discloses a distortion compensation circuit of multi level quadrature amplitude modulation for performing gain control of transmission power by an attenuator placed on the input of an amplifier.

(3) Claim 7 to 11

(Reference 1 to 5)

Providing a feedback pass between amplifying means and predistortion means, and said predistortion means changing at least one of the predistortion value could be done by a person skilled in the art as desired, and no special effect thereby is considered.

List of Cited References

1. Japanese Unexamined patent Publication No. 508151/1995
2. Japanese Unexamined patent Publication No. 136048/1998
3. Japanese Unexamined patent Publication No. 507368/1997
4. Japanese Unexamined Patent Publication No. 311194/1994
5. Japanese Unexamined Patent Publication No. 283743/1995

Translation-in-part of Cited References

(1) Japanese Unexamined Patent Publication No. 136048/1998
(Column 9, line 8 to line 42)

Next, the operation (of the circuit shown in Fig. 1) is explained. Output of controller 240, the open loop control signal is inputted to first inhibiting means 210, second inhibiting means 211 and amplifiers 134 and 135. First inhibiting means 210 makes the system open loop, second inhibiting means 211 suppresses the output of the signal and amplifiers 134 and 135 makes open loop control by changing their gain. Outputs of adders 126, 127 and outputs of quadrature demodulator 180 through adders 122,123 are inputted to comparator 220. Reference voltage, the output of reference voltage circuit 230 which provides reference voltage by control signal being the output of controller 240 in accordance with the training status is compared with the output of adders 126, 127 and with the output of quadrature demodulator 180. Resulting information of the comparison being an input to controller 240 controls offset compensating circuit 310, 311, phase shifter 200 and amplitude compensating circuit 290 respectively.

DC offset adjustment is made through controlling the offset controlling circuit 310 by comparing the signals at detecting points aI and aQ with the reference voltage being the output of reference voltage circuit 230. Further, outputs of quadrature demodulator 180 are picked up at detecting points bI and bQ, inputted to comparator 220 and controls offset compensation circuit 311 of feedback side based on the result of the comparison.

Phase shift adjustment is made so that inputting digital

baseband signal, detecting output signals of quadrature demodulator 180 through feedback circuit at detecting point bI and bQ and inputting them to comparator 220. Comparator 220 compares the reference signal being the output of the reference voltage circuit 230 with the outputs of quadrature demodulator 180 and phase shifter 220 is controlled by controller 240 based on the result of the comparison.

Amplitude adjustment of I, Q components of input baseband signal is made so that inputting input digital baseband signal, detecting these signals at detecting points aI and aQ, inputting them to comparator 220 together with the output of reference voltage circuit 230 and comparing the both. Controller 240 controls amplitude compensating circuit 290 based on the result of the comparison and judgement.

(2) Japanese Unexamined Patent Publication No. 311194/1994

(Paragraph [0014] and [0015])

[0014]

[Embodiment] Thereafter, an embodiment of the present invention is explained with referring to the drawings. Fig. 1 shows a distortion compensation circuit of multi-level quadrature amplitude modulation. This distortion compensation circuit of multi-level quadrature amplitude modulation is provided with a (second) attenuator (ATT) 42, in addition to the circuit shown in Fig. three, and being configured to be capable of gain control of transmission power, and further provided with a controller (CT) 10 which controls an attenuator ATT41 for controlling feedback amount in accordance with the control operation for ATT42 from outside and preventing feedback loop from

being unstable.

[0015]

In particular, when attenuation of ATT42 is increased by an operation from outside, CT10 decreases attenuation of ATT41 to increase feedback amount. On the contrary, when attenuation of ATT42 is decreased by operation, attenuation of ATT41 is increased, thus transfer function of the feedback loop is kept constant regardless of gain control of transmission power.

OUR COMMENTS

Three of Five references cited in Office Action are also published as:

1. Japanese Unexamined patent Publication No. 508151/1995
correspond to WO94/17599
3. Japanese Unexamined patent Publication No. 507368/1997
correspond to WO96/12343
5. Japanese Unexamined Patent Publication No. 283743/1995
correspond to USP 5,530,920

Our analysis of Office Action will be followed by facsimile in near future.

整理番号: JP-12806PCT 発送番号: 356258 発送日: 平成16年10月 5日 1

拒絶理由通知書

特許出願の番号	特願2000-591719
起案日	平成16年 9月27日
特許庁審査官	高木 進 8628 5J00
特許出願人代理人	朝日奈 宗太 (外 3名) 様
適用条文	第29条第2項

この出願は、次の理由によって拒絶をすべきものである。これについて意見があれば、この通知書の発送の日から3か月以内に意見書を提出して下さい。

理 由

この出願の下記の請求項に係る発明は、その出願前日本国内又は外国において頒布された下記の刊行物に記載された発明に基いて、その出願前にその発明の属する技術の分野における通常の知識を有する者が容易に発明をすることができたものであるから、特許法第29条第2項の規定により特許を受けることができない。

記 (引用文献等については引用文献等一覧参照)

- ・請求項 1-2, 12-22
- ・引用文献等 1-2
- ・備考

引用文献1 (特に図3-4に関する記載を参照) には、電力増幅器で増幅された多重搬送波信号を各変調器へ帰還させ、直線性を補償する旨が記載されている。引用文献2 (特に図1-2に関する記載を参照) には、電力増幅器の出力の一部を帰還させ、DCオフセット調節、位相シフト及び振幅の調整を行う旨が記載されている。即ち、プレディストーション手段によって、予め与えられる歪を増幅手段における入力と出力のあいだの差異に依存して順次変化させることは、当業者が容易になし得ることである。

- ・請求項 3-6
- ・引用文献等 1-4
- ・備考

複合信号を合成するためにコンバイナ手段を用いたり、プレディストーション手段を信号合成前又は合成後で行うことは、当業者が適宜なし得ることであり

整理番号: 発送番号:356258 発送日:平成16年10月 5日 2

、それによる格別な効果も認められない。例えば、引用文献3（特に図1に関する記載を参照）には、3つの可変利得前置増幅器の出力をコンバイナにおいて組み合わせる旨が記載されている。また、引用文献4（特に図1に関する記載を参照）には、AMPの入力段に減衰器を設けて送信電力の例特制御を行う多値直交振幅変調波歪補償回路が記載されている。

- ・請求項 7-11
- ・引用文献等 1-5
- ・備考

増幅手段とプレディストーション手段との間にフィードバックパスを備えて、プレディストーション手段が少なくとも1つのプレディストーション値を与えたり、変化させたりすることは、当業者が適宜なし得ることであり、それによる格別な効果も認められない。例えば、引用文献5（特に図1-8に関する記載を参照）には、自動レベル制御優先選択手段を設けて、選択された特定の変調器のみを駆動させる旨が記載されている。

ここで、請求項8に記載された「フィードバックパスからの出力前記増幅手段」は、「フィードバックパスからの前記増幅手段の出力」と読み替えた。

拒絶の理由が新たに発見された場合には拒絶の理由が通知される。

引用文献等一覧

1. 特表平7-508151号公報
2. 特開平10-136048号公報
3. 特表平9-507368号公報
4. 特開平6-31194号公報
5. 特開平7-283743号公報

先行技術文献調査結果の記録

- ・調査した分野 IPC第7版 H04B1/04
- ・先行技術文献 特開平10-145146号公報
 特開平9-224064号公報
 特開平7-202763号公報

この先行技術文献調査結果の記録は、拒絶理由を構成するものではない。

この拒絶理由通知の内容に関するお問い合わせ、または面接のご希望がござい

整理番号: 発送番号:356258 発送日:平成16年10月 5日 3/E

ましたら下記までご連絡下さい。

特許審査第四部 伝送システム 高木進

TEL. 03 (3581) 1101 内線3535

FAX. 03 (3501) 0699